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ROBERT GROOVER
17000 PRESTON ROAD #230
DALLAS TX 75248

EXAMINER
NGUYEN, T

ART UNIT	PAPER NUMBER
3661	

DATE MAILED:
11/21/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

☒ Responsive to communication(s) filed on _Sep 25, 2000_ _____ .

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under _Ex parte Quayle_, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire ___three___ month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) _1-27, 29-37, and 39-46_ _____ is/are pending in the application.

☐ Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) _1-27, 29-37, and 39-46_ _____ is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

    ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

        ☐ received.

        ☐ received in Application No. (Series Code/Serial Number) _____ .

        ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    *Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- *SEE OFFICE ACTION ON THE FOLLOWING PAGES* ---

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2.   Claims 1-27, 29-37, 39-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Rossin et al (U.S Patent No. 5,877,773) in view of Watkins et al (U.S Patent No. 5,361,386) and

further in view of Narayanaswami (U.S Patent No. 5,613,052).

As per claim 1, 6, Rossin et al teaches a method for clipping graphics primitives. The

method comprises the steps of: using a clipping algorithm with a circular buffer to store input and

output polygons of the primitive (fig.5A; col.9, lines 60-67 and col.10, lines 1-27; and col.4, lines

17-32).

Rossin et al does not teach defining all vertices of a primitive using relational coordinates.

However, Watkins et al teaches defining all vertices of a primitive using relational coordinates as

claimed (col.9, lines 66-68 and col.10; and col.11). It would have been obvious to a person of

ordinary skill in the art at the time the invention was made to define the vertices of a primitive in

barycentric coordinate as taught by Watkins et al in the clipping method of Rossin et al. The

motivation for this would have been to facilitate interpolation to determine the color and light of

the intercepted points of the clipping planes and the polygon and to easily determine if a point on

the clipping plane in inside or outside the polygon as taught by Watkins et al in abstract and col.9,

lines 4-17.

Rossin et al does not explicitly teach indicating visibility with respect to each plane of a

view volume for each vertex. However, Narayanaswami teaches indicating whether each vertex is

visible with respect to each plane of a view volume (col.5, lines 44-63). It would have been

obvious to a person of ordinary skill in the art at the time the invention was made to indicate

visibility for each vertex of the polygon of Rossin et al. The motivation for that would have been

to perform clipping and lighting calculation according to the visibility indication of the vertex as

taught by Narayanaswami in col.8, lines 31-36.

As per claim 2, rasterizing only vertices which are visible in all planes would have been

well known to a person of ordinary skill in the art at the time the invention was made.

As per claim 3, Narayanaswami teaches performing clipping prior to lighting or texture

calculation (col.1, lines 53-67).

As per claim 4-5, Rossin et al teaches polygon and triangle primitive (col.1, lines 24-33).

As per claim 7, using frustum view volume as clipping planes would have been well known to a person of ordinary skill in the art at the time the invention was made. It would have been an obvious choice to a person of ordinary skill in the art at the time the invention was made to use the well known frustrum volume instead of the clipping planes of Rossin et al.

As per claim 8-10, Rossin et al teaches there are six or more planes in view volume (col.3, lines 31-36).

As per claim 11, Rossin et al teaches Sutherland and Hodgman clipping algorithm (col.19, lines 53-58).

As per claim 12-13, Narayanaswami teaches indicating vertex visibility by a bit flag (col.5, lines 44-67; and col.6, lines 1-14). Narayanaswami does not teach 12 bit visibility flag. However, Narayanaswami teaches selecting the number of the visibility bit flag according to the number of non-overlapping region (col.5, lines 44-52). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to select the twelve bit flag when the twelve clipping planes of Rossin et al is used.

As per claim 14, Rossin et al does not teach using two circular buffers to store input and output polygons. However, Rossin et al teaches using circular buffer (fig.5A; col.9, lines 60-67

and col.10, lines 1-27; and col.4, lines 17-32). It would have been obvious to a person of ordinary

skill in the art at the time the invention was made to integrate duplicate circular buffer of Rossin et

al, because integrating duplicated circular buffer together involves only routine skill in the art (St.

Regis Paper Co. v.bennis Co., 193 USPQ 8).

As per claim 15, Rossin et al teaches a circular buffer with maximum storage of sixteen

vertices (col.5, lines 44-48).

As per claim 16-27, 29-37, and 39-46, refer to discussion in claims 1-8, 11-12, 14-15

above. Further, as to claim 19, Naraynaswami discloses including outcode value (c_3, c_2, c_1 and

c_0 in col.5, lines 58-61) that indicates whether the vertex is visible with respect to each plane (x=-

1, x-1, y=-1, y=1) of the view frustum. Further, as to claim 36, and 43, the claimed display,

processor, and video rendering hardware would have been very well known to a person of

ordinary skill in the art. Rossin et al does not teach using two circular buffers to store input and

output polygons. However, Rossin et al teaches using a circular buffer which stores input and

output polygon (fig.5A; col.9, lines 60-67 and col.10, lines 1-27; and col.4, lines 17-32). It would

have been obvious to a person of ordinary skill in the art at the time the invention was made to

integrate duplicate circular buffer of Rossin et al, because integrating duplicated circular buffers

together involves only routine skill in the art (St. Regis Paper Co. v.bennis Co., 193 USPQ 8).

Response to Arguments

A request for interview on September 25, 2000 from applicant has been received. However, with the applicant's explanation in the amendment filed on September 25, 2000, examiner beleives that the specific issues is clarified. Examiner also beleives that is would be more beneficial to applicant to review the following explanation from examiner in order to be prepared with a proposed amendment of claims before an interview should be conducted. As suggested in the MPEP 713.01 that an interview should be had only when the nature of the case is such that the interview could serve to develop and clarify specific issues and lead to a mutual understanding between the examiner and the applicant, and thereby advance the prosecution of the application.

In response to applicant's argument on page 7, third and fourth paragraph "Rossin et al does not show the use of circular buffers ... the circular buffer taught in the present application requires only one buffer". Although, applicant explains that the circular buffer of the present invention and the sequential processing allows the use of only one buffer instead of having to use an extra look up table buffer to store the index of the polygon information, independent claims 1, 16, 36, 43 do not explicitly disclose the feature. Independent claims 1, 16, 36 and 43 just defines the circular buffer as a memory which stores input and output of polygons of the primitive. In fig.5A, Rossin et al discloses using a buffer (the vertex look up table) which stores the input and output list of polygons of the primitive. This reads on the claimed limitation in independent claims 1, 16, 36, and 43. Examiner agrees with applicant's explanation that Rossin et al's invention

allows exchanging data anywhere in the in the VRAM as stated in col.11, lines 66-67. However, independent claims 1, 16, 36, and 43 do not explicitly exclude the use of separate buffers which are ping-ponged between each other as explained.

In response to applicant's argument on page 8, last two paragraphs, examiner admits that none of the references suggest the use of two buffers instead of one. However, Rossin et al teaches using a circular buffer which stores input and output polygon (fig.5A; col.9, lines 60-67 and col.10, lines 1-27; and col.4, lines 17-32). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to integrate duplicate circular buffers of Rossin et al, because integrating duplicated devices together involves only routine skill in the art (St. Regis Paper Co. v.bennis Co., 193 USPQ 8).

Notice

The examiner in charge of this application has been transferred to the new art unit 3661. Please indicate the appropriate art unit in future correspondence.

3.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date

of this final action.

Any response to this final action should be mailed to:

Box AF

    Commissioner of Patents and Trademarks

    Washington, D.C. 20231

or faxed to:

    (703) 305-7687, (for formal communications; please mark "EXPEDITED

    PROCEDURE")

Or:

    (703) 305-7687 (for informal or draft communications, please label

    "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park V, 2451 Crystal

Drive, Arlington. VA., Seventh Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Thu Nguyen whose telephone number is (703) 306-9130. The examiner can

normally be reached on Monday-Thursday from 8:00 am to 5:00 pm ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

William Cuchlinski, can be reached on (703) 308-3873. The fax phone number for this Group is

(703)305-7687 .

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Group receptionist whose telephone number is (703)308-1113.

NTV

November 20, 2000

WILLIAM A. CUCHLINSKI, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600